

Balancing Freshwater Inflows in a Changing Environment

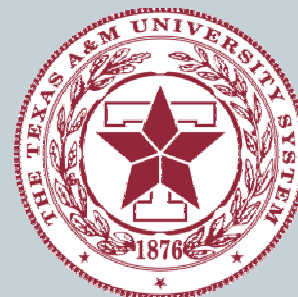
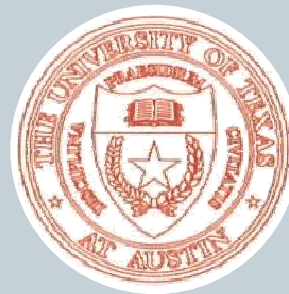
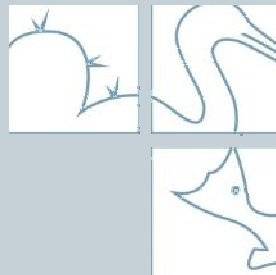
Collaborating for Water Conservation on the Texas Coast



KIERSTEN MADDEN

STEWARDSHIP COORDINATOR

MISSION-ARANSAS NATIONAL ESTUARINE RESEARCH RESERVE



PROTECTED PLACES:

Estuaries & coastal watersheds are better protected & managed by implementing place-based approaches at Reserves.

SCIENCE:

NERRS scientific investigations improve understanding & inform decision affecting estuaries & coastal watersheds.

PEOPLE:

NERRS education & training increases participants' environmental literacy and ability to make science-based decisions related to estuaries & coastal watersheds.

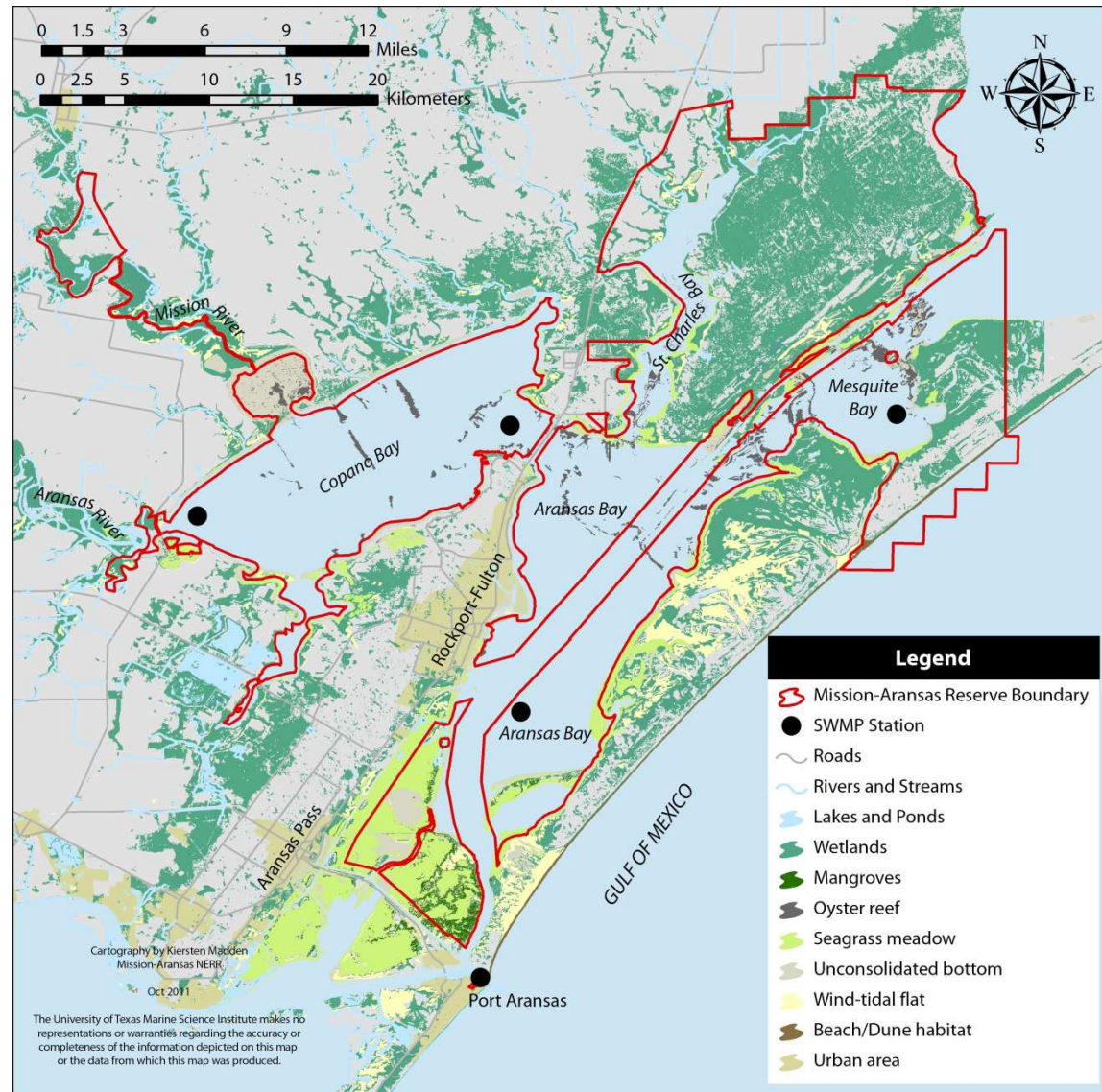


NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

*“Resilient estuaries & coastal watersheds
where human & natural communities thrive”*

Mission-Aransas National Estuarine Research Reserve

*Brings together
scientists, landowners,
policy-makers, & the
public to ensure that
coastal management
decisions benefit flora &
fauna, water quality, and
people.*



What do we do?



RESEARCH



Improve understanding of Texas coastal zone ecosystem structure and function

STEWARDSHIP



Promote public appreciation and support for stewardship of coastal resources

EDUCATION



Increase understanding of coastal ecosystems by diverse audiences

TRAINING



Increase understanding of coastal ecosystems by coastal decision makers

Freshwater inflows are essential for estuaries . . .



Image courtesy Liam Gumley, Space Science and Engineering Center, University of Wisconsin-Madison and the MODIS science team



Photo by jean-pierre muller/afp/getty images



Source: National Cancer Institute Author: Renee Comet (photographer) AV Number: AV-9400-4228 Date Created: 1994

Senate Bill 3



Mar 1, 2011: BBEST recommendation
Sept 1, 2011: BBASC recommendation
Sept 1, 2012: TCEQ adopts standard

The new law establishes a process for determining how much water is needed and begins the process of securing the water for the environment . . .

Bay/Basin Expert Science Team

Group of technical experts.

Make recommendations for flow based on best-available science.

Provide recommendations to the BBASC (stakeholders).

Bay/Basin Stakeholder Committee

Diverse group of stakeholders.

Consider BBEST recommendations in conjunction with water policies.

Make recommendations to TCEQ.

Texas Commission on Environmental Quality

Consider recommendations from BBEST, BBASC, and general public.

Adopt formal environmental flow standards.

Environmental
Flows Advisory
Group

Science
Advisory
Committee

Freshwater Inflows: Determining flow regimes in the face of land use, climate change, and other unknowns

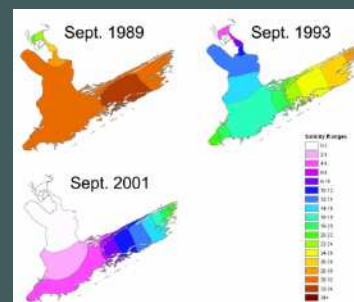
OBJECTIVE 1

Examine the effects of land use and climate change on freshwater inflows to the Guadalupe-San Antonio and Mission-Aransas.



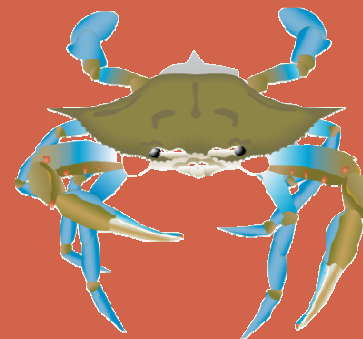
OBJECTIVE 2

Improve inputs to the TxBLEND salinity model of the Texas Water Development Board.



OBJECTIVE 3

Collaborate with intended users to identify and conduct a priority research project related to a focal species mentioned in the BBEST report.

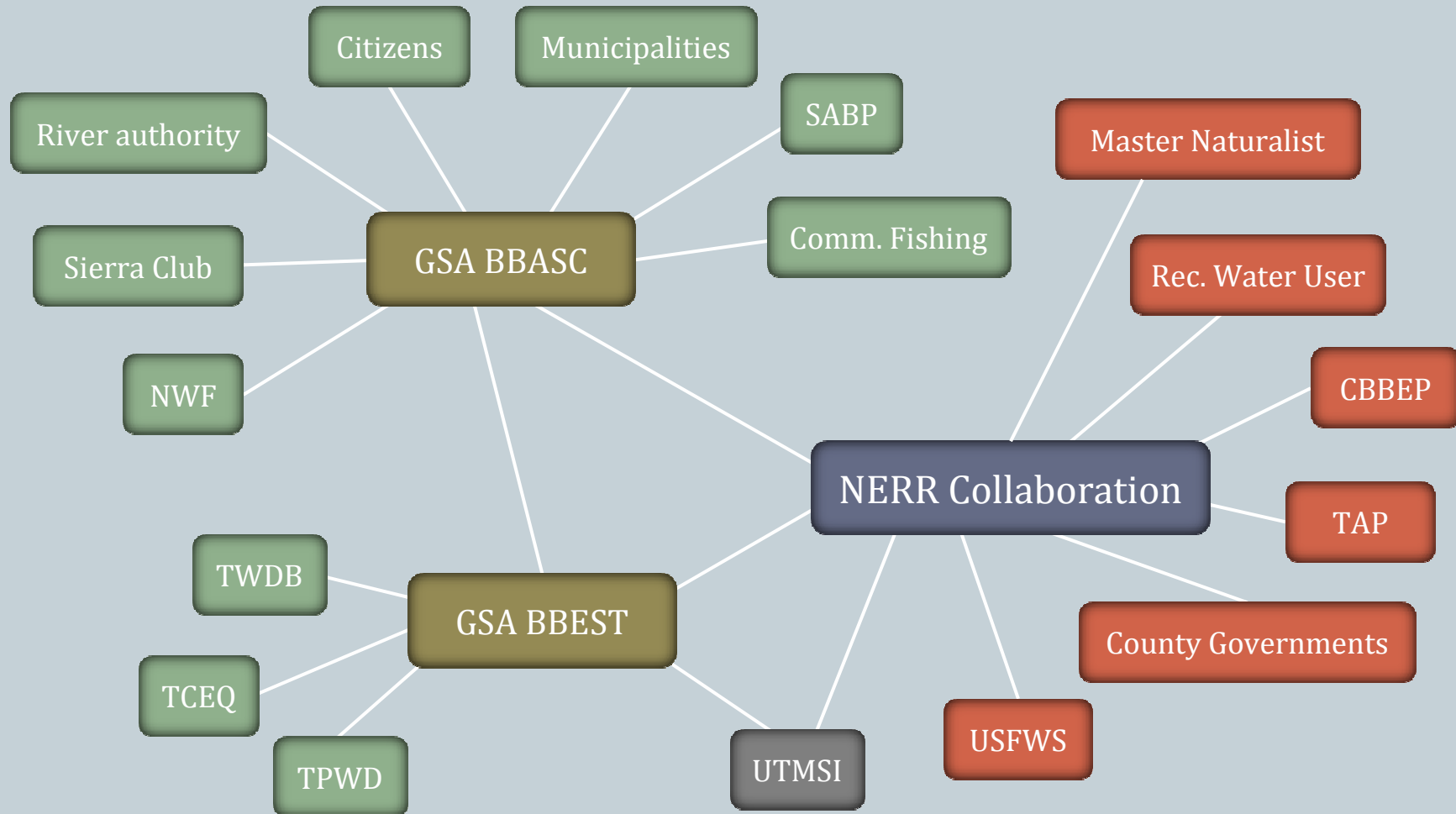


OBJECTIVE 4

Develop shared systems learning among the local stakeholders and scientists for construction of a system dynamics model.

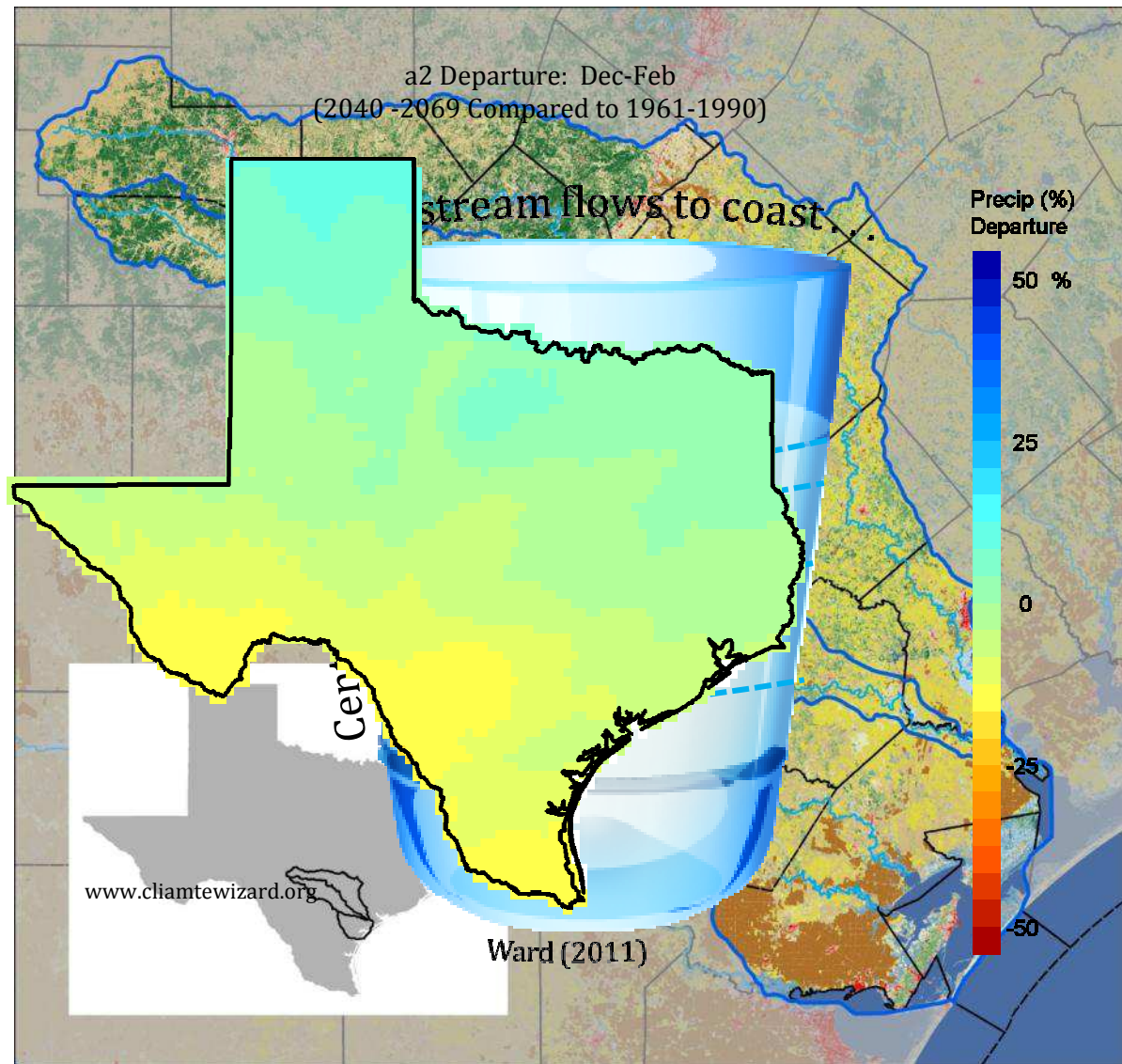


Stakeholders



Objective 1

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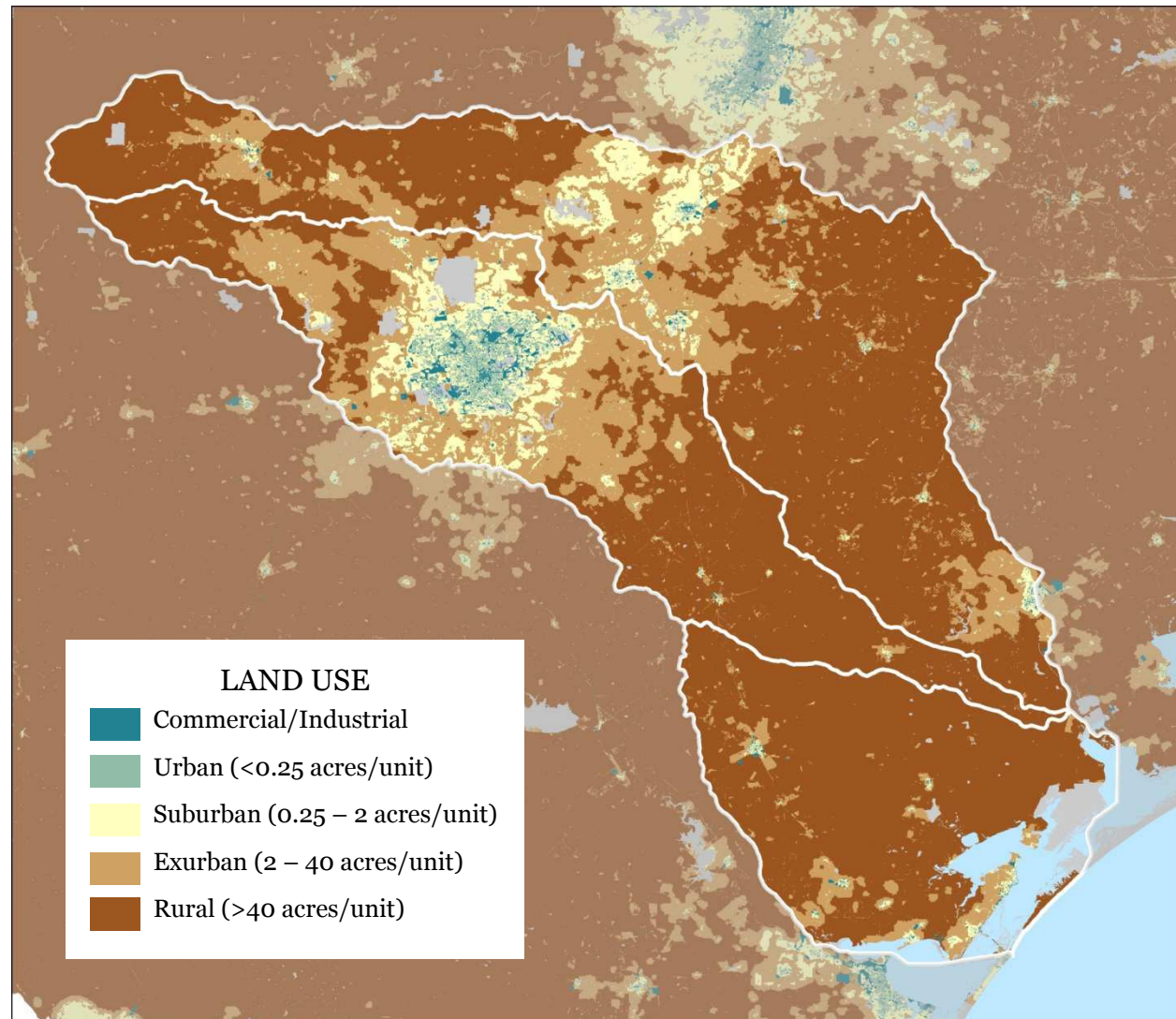
This the highest ICLUS population projection and for most areas in the U.S. represents a “worst case” pattern of development.

A2: Slower rate of economic growth.

Restricted flow of people and ideas across regions.

Fertility and average U.S. household size increase.

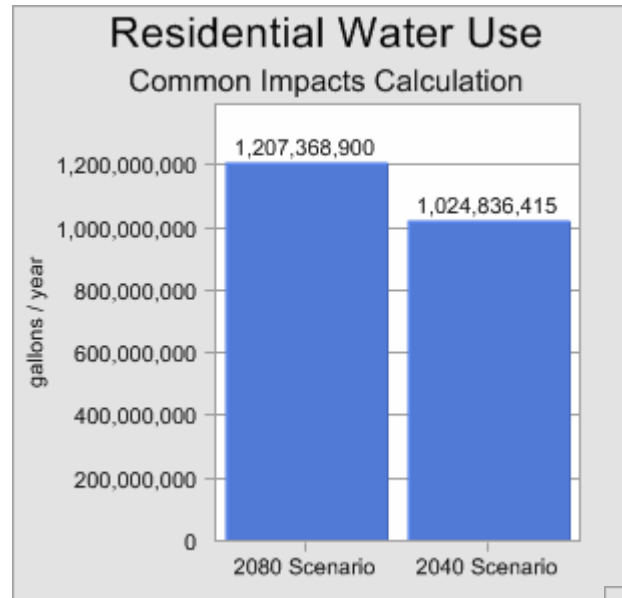
Domestic migration is high, but net international migration is moderate.



ICLUS: INTEGRATED CLIMATE AND LAND USE SCENARIOS

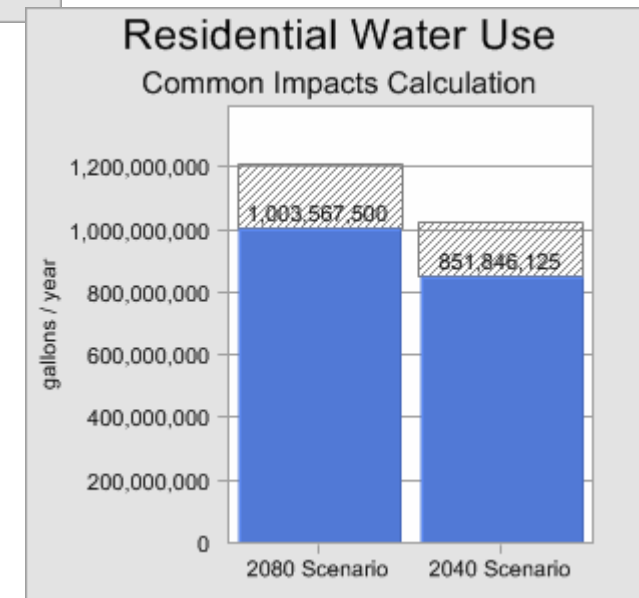
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Based on 391 gallons/household/day

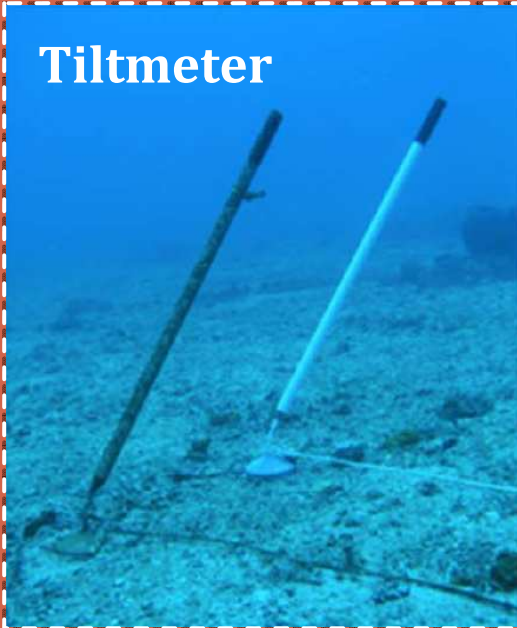
Based on 325 gallons/household/day



Objective 2

Improve inputs to the TxBLEND salinity model of the Texas Water Development Board.

Tiltmeter



Objective 3

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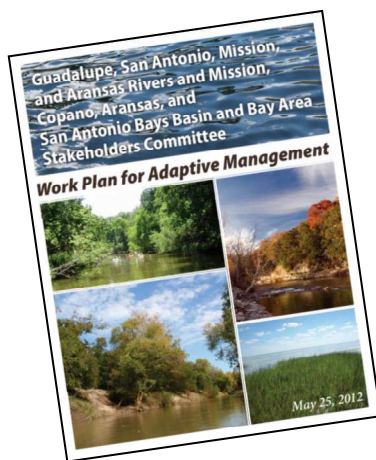
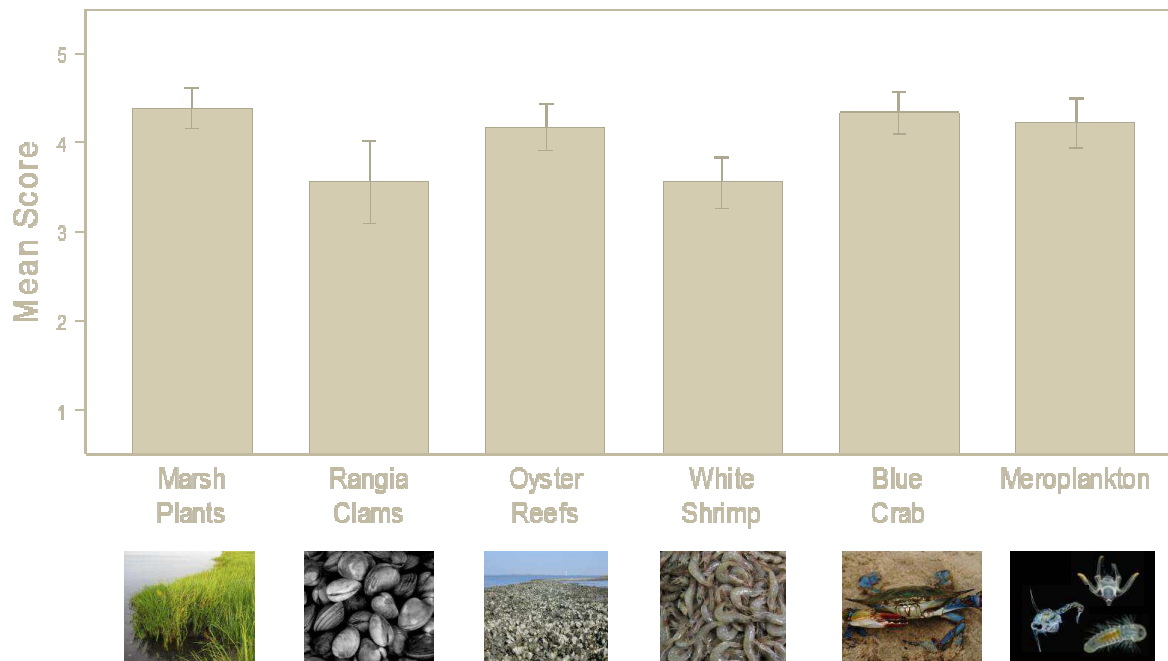
Freshwater Indicator Species

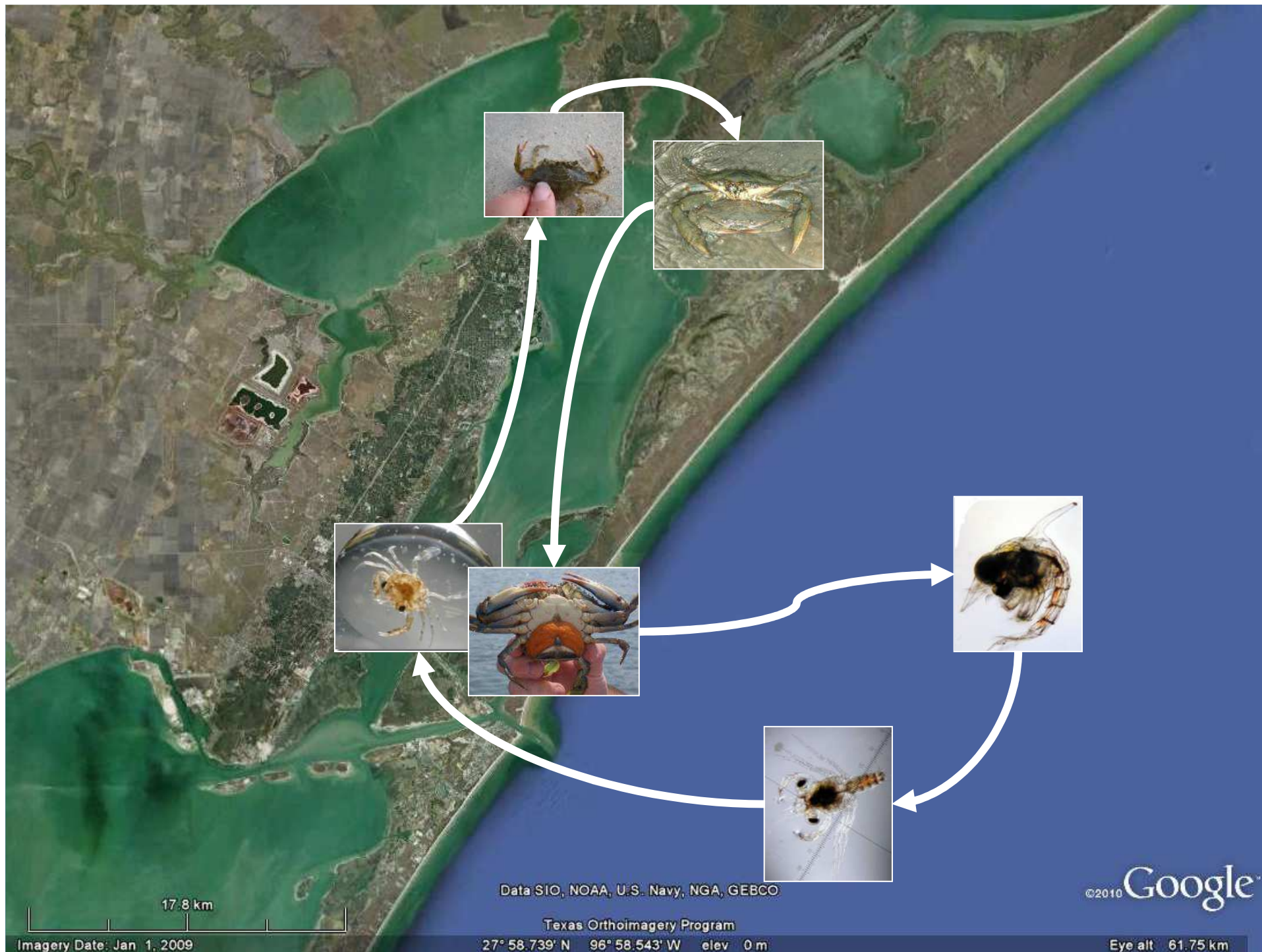


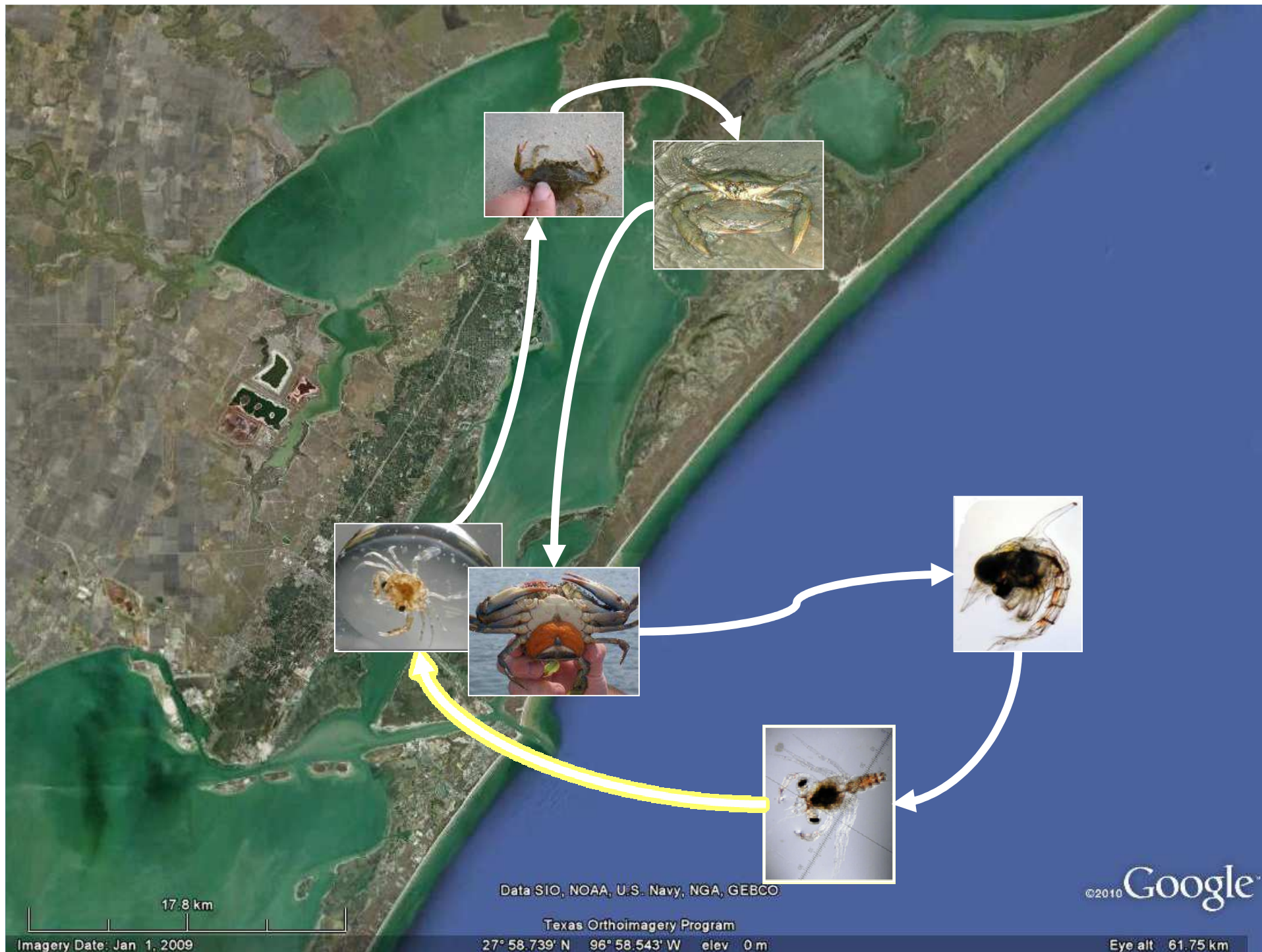
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Freshwater Indicator Species



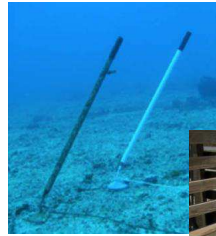




Objective 3

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Blue Crab Research



**FIELD
WORK**

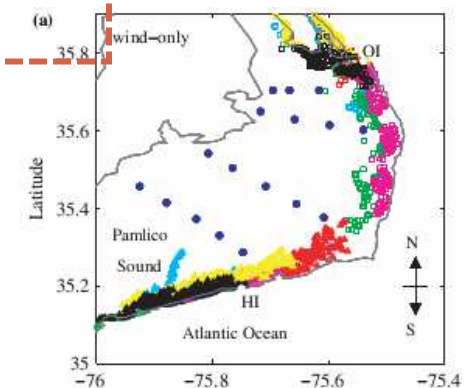
DROUGHT

Add **hypersaline** water



**LAB
EXPERIMENTS**

MODELING

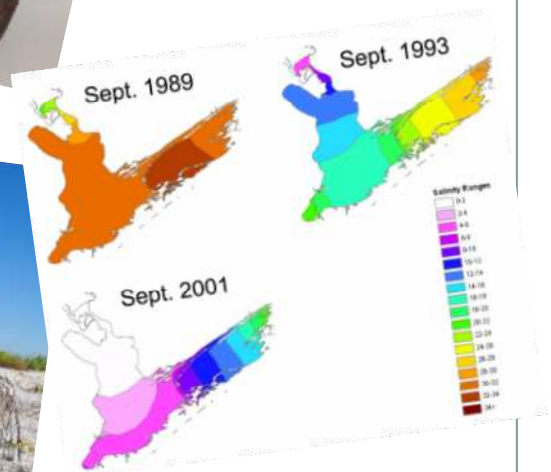
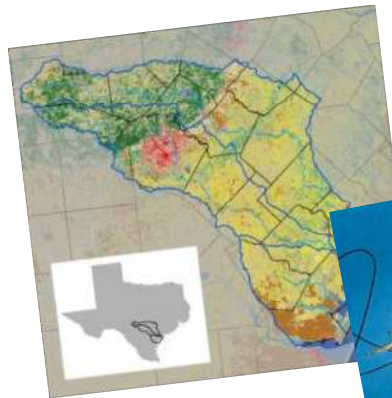


Objective 4

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Shared Systems Learning

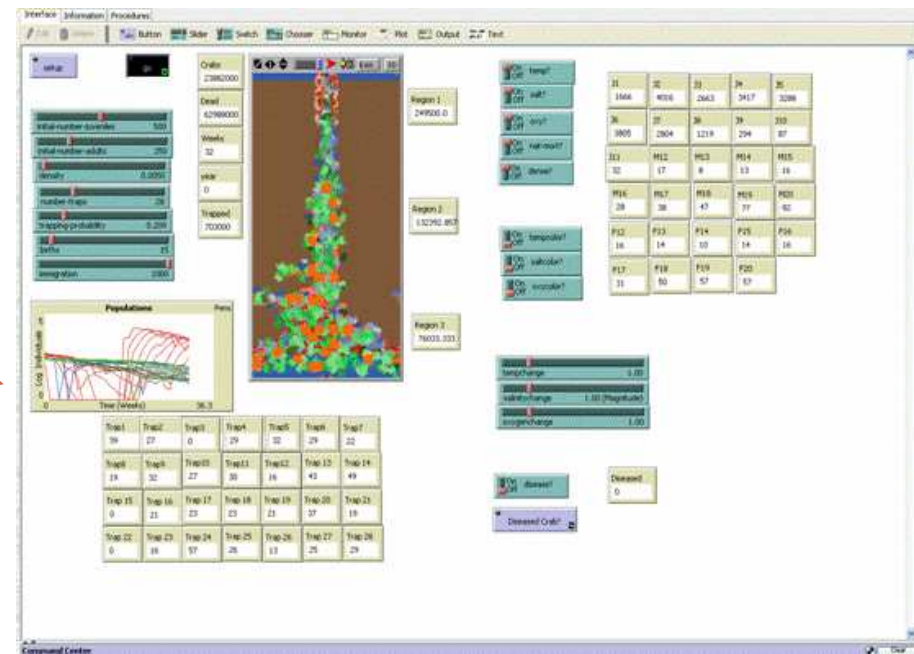
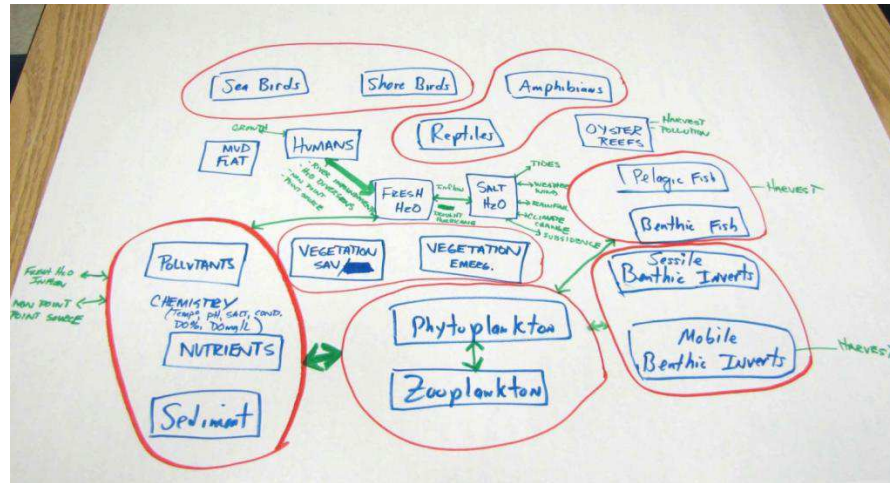
... a way of learning by emphasizing connections rather than separate parts.



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Develop shared systems learning among the local stakeholders and scientists for construction of a system dynamics model.

Mediated Modeling



You're Invited . . .



SAVE THE DATE

**Balancing Freshwater
Needs in a Changing
Environment:**
*Third Meeting of
Collaborative Participants*

**January 17th, 2013
9:00 A.M. - 4:00 P.M.**

Please join us at the Mission-Aransas
National Estuarine Research Reserve
750 Channel View Drive
Port Aransas, TX 78373

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Questions?



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http://www.Missionaransas.Org/post_science_sciencecollaborative.Html